CSCE100 Introduction to Informatics
Fall 2021

Programming Assignment 1: Metric Converter

Points: 100 points. Assignment Date: September 7, 2021 Due Date: September 14, 2021

Objectives

1. To familiarize with writing and running Python programs and the Python environment
2. To familiarize with the use of conditionals and branching
3. To familiarize with data structures
4. To familiarize with standard input/output in Python
5. To be exposed to the use of built-in functions

Relevance to Informatics or Data Science

1. A user interface program for collecting data
2. A program for pre-processing or processing data

Problem

Write a program that will prompt the user for a choice between 1 and 4, with each choice being a different metric conversion option: 1 for converting kilometers to miles, 2 for converting kilograms to pounds, 3 for converting Celsius to Fahrenheit, and 4 for converting Cubic Meter to Cubic Feet. After that, the program will prompt the user to enter a value. The program then converts the value using the metric conversion option chosen, and prints the converted value to the screen. After that, the program exits. Here are some additional requirements:

- The program is required to display an explanation of the choices in the beginning before prompting the user for a choice. (5 points)
- The program is required to display the user's choice – this is known as "echoing user input". (5 points)
- The program is required to display a message (such as "Thank you for using this program.") before exiting. (5 points)
- If the user enters a choice that is invalid, the program is required to display an error message (such as "Sorry, your input is invalid."). (5 points)
- You must document your program (see https://devguide.python.org/documenting/).
    - Name, Date, Affiliation, a description of the program, what inputs does it need, what outputs does it generate (5 points)
    - Inline comments in the program (5 points)
- You are required to use the correct metric conversions. (Hint: Try using Google to find out the metric conversion rates.). (5 points)

Example Session Runs (red texts provided by user)

```
Welcome to the Metric Converter program!
Here are the metric conversion options:
1. Kilometers to Miles
2. Kilograms to Pounds
3. Celsius to Fahrenheit
4. Cubic Meter to Cubic Feet
Please enter your metric conversion option:
1
Please enter your value to be converted:
5
You have chosen option #1: Kilometers to Miles
5.0 kilometers equals 3.106855 miles
Thank you for using the Metric Converter program.  Bye!
```

```
Welcome to the Metric Converter program!
Here are the metric conversion options:
1. Kilometers to Miles
2. Kilograms to Pounds
3. Celsius to Fahrenheit
4. Cubic Meter to Cubic Feet
Please enter your metric conversion option:
999
Please enter your value to be converted:
999
Sorry, invalid input! Options are 1, 2, 3, or 4.
Thank you for using the Metric Converter program.  Bye!
```

```
Welcome to the Metric Converter program!
Here are the metric conversion options:
1. Kilometers to Miles
2. Kilograms to Pounds
3. Celsius to Fahrenheit
4. Cubic Meter to Cubic Feet
Please enter your metric conversion option:
3
Please enter your value to be converted:
100
You have chosen option #3: Celsius to Fahrenheit
100.0C equals 212.0F
Thank you for using the Metric Converter program.  Bye!
```

Handin

1. The submission deadline for all handins is September 14, 2020, 11:00 AM. **Late handins will *not* be accepted or graded.**
2. Using the Assignment link on the Canvas course website, you are required to submit a screen capture(s) of your "testing session(s)" using your program. (10 points)

3. Using the Assignment link on the Canvas course website, you are required to submit all program files. (10 points)

Think About

Now, think about the data collection tools or mechanisms or protocols that we have experienced. In our program, we explicitly solicit input from the user. Are there data collection tools that do not explicitly solicit input from the user? How do they accomplish the task? How do they store their data? Do you know whether there is data being collected about you on any given day? Can you envision how the programs are designed to collect such data?